

the water in cm units from the position in the water to the position to which the water was drawn up, and evaluating the water repellency based on the condition of water absorption.

5           Examples 1-4

The following examples employed a plain woven cotton cloth (hereunder referred to as "cotton cloth A") with spun cotton yarn of 200  $\mu$ m thickness using a conventional fiber size of 20  $\mu$ m with a fabric thickness of 0.3 mm, and aluminum phosphate.

The meter yarn count of the woven fabric yarn was No. 20 (20 km/kg), and the plain weave thread count was 60 x 60/(2.54 cm)<sup>2</sup> (specific weight: 153 g/m<sup>2</sup>).

15           Cotton cloth A was cut into ten 400 mm squares and these were used as green samples. After immersing each of these in a 15% aqueous aluminum phosphate solution, they were drawn up and drained, and used as 5 wt% aluminum phosphate soaked sheets. The soaked sheets were sandwiched between graphite wafers, embedded in packing coke and placed in an electric furnace with a non-oxidizing atmosphere for one week for carbonization firing of the ten sheets at 900°C.

20           Five of the sheets were sandwiched between graphite wafers and fired at 1800°C in an Atchison graphitizing furnace.

25           The sheets obtained after firing at 900°C were carbon fiber woven fabrics with satisfactory appearance, a thickness of 0.28 mm and 352 mm square dimensions, remaining in the shape of the plain woven green samples.

30           Similarly the sheets after firing at 1800°C were carbon fiber woven fabrics with satisfactory appearance, a thickness of 0.26 mm and 348 mm square dimensions, remaining in the shape of the plain woven green samples.

35           Five each of the 900°C fired samples and the 1800°C fired samples were used as property measurement samples and washed and dried, and the properties were measured

Examples 5-8

Four of the carbon fiber woven fabrics from each of Examples 1-4 were immersed in a Teflon dispersion solution (FEP Dispersion Solution, Daikin Industries Co., Ltd.) and drawn out from the solution, to fill each carbon fiber woven fabric with the FEP powder to 10 mass%.

Each of these was sandwiched between graphite wafers and heat treated at 300°C for 30 minutes. After the heat treatment, the compressive strength, layer transverse resistance and gas permeability were measured in the same manner as Examples 1-4. The results for Examples 5-8 are shown in Table 2.

The results demonstrate that addition of Teflon enhances the compressive strength without significantly lowering performance in terms of layer transverse resistance or gas permeability.

Examples 11-14

One each of the remaining carbon fiber woven fabrics of Examples 1-4 was also subjected to property measurements. The results for Examples 11-14 are also shown in Table 2. This table demonstrates that addition of Teflon prevents water absorption and enhances water repellency.

Examples 21-32

5 A cotton cloth of the same weight per square meter  
obtained by plain weaving yarns made by twisting two  
yarns of the same size as the yarn of cotton cloth A used  
in Examples 1 and 2 (same size of the fibers composing  
the yarns) (cotton cloth B, weight: 325 g/m<sup>2</sup>) and a  
cotton cloth of the same weight per square meter obtained  
by plain weaving of non-twisted yarn narrower than cotton  
cloth A and of a size such that the fiber size after  
10 firing in a non-oxidizing atmosphere was 8  $\mu$ m (cotton  
cloth C), were fired at 900°C and 1800°C in the same  
manner as Examples 1 and 2.

After firing, carbon fiber woven fabrics from cotton  
cloths B and C were immersed in a dispersion solution in  
15 the same manner as Examples 11 and 12 and then heated and  
Teflon treated under the same conditions.

Separately, cotton cloth B was fired in a non-  
oxidizing atmosphere at 900°C and 1800°C and directly  
used as a carbon fiber woven fabric without Teflon  
20 treatment, and the properties of both were examined by  
the same methods as Examples 1-8. The water absorption  
height was only determined for the Teflon-treated sample.

The results for Examples 21-32 are shown in Table 3.  
The obtained carbon fiber woven fabrics had satisfactory  
25 appearances with thicknesses of 0.2-0.3 mm.